

CLAIMS

What is claimed is:

1. An optical space combining device configured to superimpose one image over an object, the device comprising:
a partial reflective device having a front surface and a back surface; and
a display member having a display surface configured to display a display image, said display member configured to be oriented with respect to said partial reflective device so that said display image appears superimposed to a viewer over the object.
2. The device of claim 1, wherein said display member is fixable in a position with respect to said partial reflective device.
3. The device of claim 1, wherein said display member is movable with respect to said partial reflective device.
4. The device of claim 3, wherein said display member maintains a constant orientation with respect to said partial reflective device.
5. The device of claim 1, wherein said display member is movably rotatable with respect to said partial reflective device.
6. The device of claim 2, wherein both of said partial reflective device and said display member is movable with respect to the object.
7. The device of claim 2, wherein both of said partial reflective device and said display member are movable with respect to the object with at least one of six degrees of freedom.

8. The device of claim 1, wherein said display image substantially corresponds with at least a portion of the object.

9. The device of claim 1, wherein said display image comprises a scanned image taken from a three-dimensional scanned image of at least a portion of the object.

10. The device of claim 1, wherein said display image comprises a real-time image.

11. The device of claim 1, wherein said display image comprises an interpolation taken from multiple images.

12. The device of claim 1, wherein said display image comprises multiple images taken from the object.

13. The device of claim 1, wherein said display image comprises multiple images that are displayed on said display member upon moving at least one of said display member and said optical combining device.

14. The device of claim 1, wherein said display image comprises multiple images configured to singularly display on said display member.

15. The device of claim 1, wherein said display image changes among said multiple images by triggering an image changing device.

16. The device of claim 1, wherein said partial reflective device comprises a half silvered mirror.

17. The device of claim 1, wherein said partial reflective device comprises an antireflective film disposed adjacent at least one of said front surface and said back surface thereof.

18. A system comprising:
a computer having at least one input device and at least one output device; and
an optical combining device coupled to said computer, said optical combining device including:
a partial reflective device having a front surface and a back surface; and
a display member having a display surface configured to display a display image, said
display member configured to be oriented with respect to said partial reflective
device so that said display image appears superimposed to a viewer over an object.
19. The system of claim 18, further comprising a tracking system coupled to said
computer.
20. The system of claim 19, wherein said tracking system comprises a transmitter device
and a receiver device.
21. The system of claim 20, wherein said transmitter comprises a magnetic field for
tracking a position of said receiver.
22. The system of claim 20, wherein said transmitter comprises a magnetic field for
tracking a position of said at least one of said partial reflective device and said display member.
23. The system of claim 21, wherein said receiver device is positionally fixed with
respect to at least one of said partial reflective device and said display member.
24. The system of claim 18, wherein said computer facilitates multiple display images,
wherein said multiple display images comprises said display image.
25. The system of claim 24, wherein said multiple display images each substantially
corresponds with at least a portion of the object.

26. The system of claim 24, wherein said multiple display images comprised of three-dimensional volumetric scan of at least a portion of the object.

27. The system of claim 26, wherein said display image changes among said multiple images by the viewer triggering an image changing device.

28. The system of claim 18, further comprising an image changing device for changing said display image among multiple display images, said image changing device triggerable by the viewer.

29. The system of claim 18, wherein said display image comprises a scanned image taken from a three-dimensional scanned image of at least a portion of the object

30. The system of claim 18, wherein said display image comprises a real-time image.

31. The system of claim 18, wherein said display image comprises an interpolation taken from multiple images.

32. The system of claim 18, wherein said display image comprises multiple images taken from the object.

33. The system of claim 18, wherein said display image comprises multiple images that are displayed on said display member upon moving at least one of said display member and said optical combining device.

34. The system of claim 18, wherein said partial reflective device comprises a half silvered mirror.

35. The system of claim 18, wherein said display member is fixable in a position with respect to said partial reflective device.

36. The system of claim 35, wherein at least one of said partial reflective device and said display member is movable with respect to the object.

37. The system of claim 35, wherein at least one of said partial reflective device and said display member are movable with respect to the object with at least one of six degrees of freedom.

38. A method of superimposing one image over an object in a medical procedure, the method comprising:
providing a partial reflective device having a front surface and a back surface;
providing a display member having a display surface configured to display a display image; and
orienting said display member with respect to said partial reflective device so that said display image appears superimposed over an object to a viewer.

39. The method of claim 38, further comprising providing a computer having at least one input device and at least one output device, said computer coupled to said display member.

40. The method of claim 39, further comprising providing a tracking system coupled to said computer, said tracking system having a transmitter device and a receiver device.

41. The method of claim 40, further comprising tracking a position of said at least one of said partial reflective device and said display member with respect to said object.

42. The method of claim 41, wherein said tracking comprises displaying a scanned image that corresponds with a portion of said object.

43. The method of claim 39, wherein said providing said computer comprises storing multiple scanned images, each of which represent a portion of the object.

44. The method of claim 39, wherein said providing said computer comprises configuring said computer to store multiple scanned images and to display said display image on said display member taken from at least one of said multiple scanned images.

45. The method of claim 44, further comprising changing said display image among said multiple images by the viewer triggering said image-changing device.

46. The method of claim 44, wherein said configuring comprises forming said display image by interpolating from said multiple scanned images.

47. The method of claim 44, wherein said providing said computer comprises providing multiple scanned images in said computer each representing portions of the object.

48. The method of claim 38, further comprising maneuvering at least one of said partial reflective device and said display member with respect to the object with at least one of six degrees of freedom.

49. The method of claim 48, wherein said maneuvering comprises aligning said display image with said object in an optical viewing path of the viewer.

50. The method of claim 48, wherein said maneuvering comprises aligning said display image to reflect in an optical viewing path of the viewer to appear superimposed with said object.

51. The method of claim 48, wherein said maneuvering comprises aligning said display image with said object so that at least a portion of said display image that represents said object appears to be substantially superimposed there over.

52. The method of claim 38, wherein said orienting comprises reflecting said display image against said partial reflective device in an optical viewing path of the viewer.